THE VETERINARY RECORD

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Edited by William Hunting, F.R.C.V.S.

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Distemper Vaccine Experiments.

The subscribers to this fund held a meeting at 10 Red Lion Square on Wednesday evening and elected a committee to superintend the experiments necessary to determine the value of preventive vaccine. The committee consists of Prof. M'Fadyean, Messrs. A. J. Sewell, H. Gray, Jno. A. W. Dollar, H. M. Singleton, E. L. Stroud, H. J. Pope, Dr. Hartley, S. Villar, with W. Hunting as sec., and W. H. Brown, 20 Fulham Road, as treasurer.

It is arranged to appoint a young veterinary surgeon to take charge of the clinical work if a suitable man can be obtained for two guineas a week. The work will be light, and most interesting to anyone undertaking it in a proper spirit. The remuneration is small, but so are the salaries attached to hospital appointments in the medical profession.

It is expected that the enquiry will extend over three months and cost just over £100. Our fund now is very little over £60, and this is the reason a M.R.C.V.S. is offered such a small honorarium.

Our immediate want is puppies over six weeks of age, but not over 16 weeks—free from disease. Anyone who can give the committee a few puppies will be gratefully thanked and payment up to 5s. a dog will be made. Communications to the Hon. Sec. will have immediate attention.

An Anti-Foot-and-Mouth-Disease Serum.

On page 668 is a translation of an article by Professor Nocard, well worth reading.

The Professor and Dr. Roux have been working for the Minister of Agriculture with a hope of discovering some means of preventing the spread of foot-and-mouth disease. They find that the serum of a recovered animal is, when hypodermically injected, a trustworthy preventive. The dose, however, is very large—800 c.c. By "reinforcing" the recovered animal the serum can be strengthened so as to reduce the dose to 20 c.c. The protection afforded is very brief—fifteen days. The difficulty of production, the dose, and the short period of protection are conditions which Professor Nocard acknowledges render the treatment impossible on a large scale. But it is valuable in cases of single outbreaks.

We have had four outbreaks in England in recent years, each starting from one centre. This serum might be very useful in case of another isolated outbreak.

SALIVARY CALCULUS.

By H. T. Ryan, C.V.S.

The Record for March 28th, in reporting the discussion which took place at the Central Veterinary Medical Society, gives an account of where a large salivary calculus was removed by one of the members in which their was neither fistula nor other ill result left.

I was rather surprised on reading the above, as I thought this happy result was more the exception than the rule, because most English authorities on the subject after giving a description of the operation always follow it up by describing minutely how to deal with a fistula, should one result, by destroying gland, etc., etc.

About 18 months ago I had to deal with a case of salivary calculus, so after consulting several other practitioners and looking up English and foreign works on the subject, I was very loth to perform the ordinary operation, but as the cob was my own property I decided to experiment. The animal was seven years old, and had been in bad condition for some time owing to not feeding well. A swelling about the size of a walnut was present on the off side of face over course of Stensons duct, and when mouth was examined a corresponding swelling (not so large) could be seen, and caused a wound on inside of cheek owing to rubbing against outside edge of third molar.

Animal on being cast and chloroformed and all asceptic precautions having been taken, I made a straight incision through skin 2½ to 3 inches long, about one inch above and parallel to upper border of swelling. The skin was dissected away from the underlying tissues till a sac-like cavity was created having a depth of about 2 inches, then an assistant held a fold of skin on face, and drew it gently downwards whilst I with my left hand easily pushed enlargement up and brought it into full view. An incision was now made along lower border of swelling through the thin zygomaticus muscle right on to lower border of duct, and a calculus was prized out with handle of scalpel. A probe was passed along duct into mouth to make sure orifice was patent, wound was syringed out with 2½ per cent. carbolic, and skin only sutured. The calculus was 1½ inches long, and had a circumference of 3 inches round thickest part. Food was withheld for 24 hours, but there was a copious discharge of saliva through sutured lips of wound till fifth day after operation, when it began to diminish and ceased on the eighth day. Sutures were removed on the tenth day, the wound healing well, and animal commenced to improve in condition.

The advantages of this mode of operation are: that when calculus is removed and parts resume their normal positions the wounds in skin, muscle, and duct are superposed one above the other, and the wound on skin being of a higher level than orifice of duct into mouth, the saliva has no tendency to work upwards to mouth of skin wound except when animal is feeding, when the excretion is increased and the muscular movements force it backwards.

RETENTION OF THE FŒTAL MEMBRANES IN THE MARE.

By J. McGavin, M.R.C.V.S., Montgomery.

A good deal has been written in your journal of late on the above subject, and, reading the cases reported therein, the writers seem to me to have a very slight grasp of their subject.

When parturition has taken place the membranes are as a rule expelled at the same time, or immediately afterwards, but if retained they become a foreign body, decompose rapidly, and are apt to set up septic poisoning, so the sooner they are voided the better.

I would like to make a few remarks under three headings, viz., Benign Retention, Abortive Retention, Aggravated, or Septic Retention.

Benign Retention.

When mares are left to nature, *i.e.* living out of doors through the winter, being supplied with a limited quantity of hay and corn, and foaling in mild weather, say in April and May, there is very seldom any retention of the membranes, and if this should occur it generally comes under the above heading. So long as there are no traumatic lesions or abrasions of the mucous membranes of the womb or genital passage the placenta may be retained for many hours without any injury being done; but knowing the great tendency there is for septic abortion, should there be any abrasion, the sooner the membranes are removed the safer and better both for the owner, the mare, and the veterinary surgeon. Unfortunately we are not always aware in what condition the passages are after the mare has foaled.

The tendency of breeders at the present time, with mares that are working and are well fed, is to have their foals dropped as early as possible after the beginning of March, and as a rule many of those mares retain their membranes. My advice to clients is—after leaving the mare for six hours, although they find the water bag trailing on the ground, but no appearance of the placenta proper coming away—this being of a darker velvety appearance, send for veterinary assistance at once.

The great majority of cases I attend to come under the heading of benign. The following is a typical case: As soon as I arrive at my client's my first order is to put a blinker bridle on the mare and get an assistant to keep the foal up to her head, so that she can see it during my manipulations. I then inject into the uterus a pint of antiseptic solution at about 108 F., and repeat this several times during the separation, as it assists materially. I try to be very careful when I come to near the last part of the cornu, and have an assistant to hold the whole of the placenta until I get the last part of it separated; one can easily ascertain whether he has got away the whole of the membranes by observing whether the end (which is like the toe of a stocking) has come away. I then prepare a bucketful of antiseptic solution 108 F. and irrigate the uterus with the whole of it, give the mare a mild stimulant and febrifuge, and in nineteen cases out of twenty no more is required and I seldom see my patients again.

Abortive Retention.

Under this heading I include for convenience all cases of retention in mares foaling prior to the natural period of gestation.

When mares abort the fœtus is usually expelled with the membranes covering it intact; but in some cases, especially when they have gone beyond half the natural period, the membranes are broken and part or whole of one cornu is left in the uterus. One peculiar symptom in those cases is that abdominal pain sets in much quicker than in cases I have placed under the other two headings. As there is nothing hanging from the vulva, and the attendant seeing a great quantity of membrane covering the dead foal, he never suspects there is any retained. The mare goes on apparently all right for a few hours when abdominal pain sets in, and they either treat the mare for colic themselves or send for a veterinary surgeon saying "the mare is suffering from gripes."

The following is a typical case: I was requested to attend a mare the other day at 7 a.m. "in great pain from gripes." After arriving there I was informed the mare was all right the night previous, and when the man entered the stable in the morning he found a dead foal behind the mare, about three parts of its natural size, with the membranes attached; the mare seemed all right, but shortly afterwards she showed great pain, scraping, lying down and getting up, rolling etc. They then resorted to their great *panacea*—Day's drinks—and administered one to the mare. Finding no benefit therefrom they sent for me.

I examined the mare and found part of the membranes retained, and after a good deal of manipulation removed them and irrigated the womb. The mare's temperature being 105° I gave her analgesics and febrifuges, and ordered the medicine and irrigations to be continued three times a day. Next day the temperature was 102° and the other symptoms improved in like manner. I repeated the treatment and the mare made a good recovery after the third day.

Aggravated or Septic Retention.

During my long experience I have had two fatal cases, and two mares rendered useless from malformation of the feet. The cause of these unfortunate terminations was, in my opinion, the attendants not carrying out my instructions properly. Ever since I am more careful in visiting the mare and seeing that everything is done properly for the first three days, after that the attendants have more practice in irri-

gation etc., and are more able to carry out my orders thoroughly. If the genital passages are carefully examined it will be found that there is a bruise or abrasion of some part of the mucous membrane; absorption of decomposed matter rapidly takes place, deranging the system, and then setting up septic laminitis and metritis. Those cases are generally the result of inexperience and ignorance on the part of the owner or attendants, as they allow the mare to remain too long before getting veterinary assistance; but any person who has ever seen a bad case will never wish to see another animal in the same condition.

The following is a typical case: I was asked about 6 p.m. to attend a well bred carriage mare, which had foaled some time during that day and had not expelled the membranes. As she was in great pain and getting rapidly worse they requested me to see her at once, but being very busy at the time it was 9 p.m. before I reached the premises. I found the mare in a bad state, nostrils widely dilated, breathing rapidly, temperature 107°, very stiff, she could scarcely move a step in the box. You may know what state she was in when it took six men to take off her two fore shoes. I at once proceeded to separate the membranes, which took me a considerable time, using several pints of antiseptic fluid during my manipulations. I irrigated the uterus; internal treatment same as the last case, adding gentle exercise. Next day the whole symptoms were improved and she was eating a little; after the third day her temperature and other symptoms were normal, she was turned out to grass and made a good recovery.

One great essential to obtaining *such a speedy recovery* is to have the mare as soon as possible after foaling. This case was commenced 12 hours after foaling, and if you compare it with the one I am going to add, which I am attending at present, you will see a great difference between the two as regards convalescence; yet both had the same treatment.

On Thursday last a nine-year-old Shire mare foaled at 3 a.m. and retained the membranes. As she was very savage no one could get into the box after she had foaled that day, but next day they managed to throw a lasso over her neck and then secured her with a halter. Some time afterwards the membranes were either dropped or broken off. She became very uneasy, breathing accelerated, and began to show symptoms of lameness in both fore feet. Next morning, as she was much worse, they sent for me. At that time I was attending two mares that could not foal so did not see her till six o'clock that night. She was then in a bad state, nostrils dilated and blowing rapidly, and in great pain, and to use their words: "She was all of a piece" and rivetted to the ground. I examined the womb and found a large quantity of dirty, brownish-yellow fluid. I removed as much as I could, and irrigated the womb three times with half a bucketful of antiseptic fluid, each time getting in return a full bucket of the fluid, which when examined contained pieces of the membranes, casts, and a lot of sediment like dark mustard. Treatment same as last case.

I saw her again on Monday; gentle improvement all round, eating better and had more milk for the foal.

Saw her again on Wednesday, much improvement had taken place; pulse 60, temperature 102½, walking better but still very lame.

My next visit was on Saturday. Temperature 101°, pulse 65, eating very well, plenty of milk for the foal, and shewing her old savage nature again, so that I had to be very careful in handling her. She is still very lame when starting, but goes much better when she is exercised a little. It will take another two weeks or more before the lameness has quite gone.

As regards allowing the membranes to be retained and giving ergot, salicylate of soda, and quinine etc., this sounds to me empirical. I admit that ergot contracts unstriped muscular fibre, especially in the human female, and is given when there is no distortion of the pelvis, the os dilated, the presentation natural, but the pains very weak. It is also given when the placenta is retained—not to remove it, but to prevent or arrest hæmorrhage, and I have yet to learn where a doctor of good repute gives ergot to remove an *adherent placenta*.

I have often gone to mares with retention, and as soon as I entered the box the mare would jump up and the membranes would drop, after being retained from six to twelve hours. Yesterday I was sent for to a mare with retention. Being engaged I could not go for three hours, and just as I was ready to start a man arrived saying the membranes were dropped all right, after having been retained nine hours. Suppose I had been there one hour previously and had given ergot, this would have been a grand case to have trumped up in its favour. According to all the literature I have access to, ergot is considered to have very little, if any, direct action on the uterus of the mare and cow, but I quite expect to see several people writing who differ entirely both as to my views and my treatment of such cases.

COCAINE AS A DIAGNOSTIC.

Subject.—Bay Waler mare, aged.

History.—Cast from native cavalry for slight lameness, purchased for road work similar to cabbing, and after a month's work became too lame to be used. Showed contraction of the heels of both fore and suggested that very rare disease in India, navicular. The lameness was most characteristic on the off side.

Diagnosis.—Everything from foot to shoulder and down again—until 1½ grains of cocaine and eucaine were injected along the course of the two plantar nerves of the off fore; when after 15 minutes the lameness was perceptibly diminished and remained so for six hours. The next day 3 grs. of the same anæsthetics were injected along the course of the median nerve with a better result than before, so diagnosis was formed as being muscular lameness of shoulder and arm combined with foot lameness.

Treatment—Median neurectomy.

Result.—Sufficient recovery to enable the animal to resume work, but still some lameness persisting.

THE DOCTOR SAHIB.

MECHANICAL CONGESTION OF LUNGS DUE TO BARBARIC DRENCHING.

By D. Fairbank, M.R.C.V.S.

Called out at 3 a m. to see a van horse, property of a provision dealer living 5 miles out in a country district. Upon arrival was told animal had been suffering from colicky pains at intervals since the previous afternoon, and that a colic draught had been given, and animal seemed to be progressing rather favourably until a neighbour appeared upon the scene and suggested giving the mare a pint of linseed oil. This was agreed to, and he immediately proceeded to drench the horse by pouring the oil down the animal's nostrils. As a consequence the mare instantly began gasping for breath and continued to breathe most laboriously; hence the despatch of a hasty message to my surgery asking for my immediate attendance. On arrival I at once informed the owner that the mare was suffering from injury to lung structure inflicted by the drenching as before mentioned. My instructions were that although the mare appeared to be almost in a state of collapse, I was to treat her with a view to ameliorate the mischief now irretrievably done. I did so to the very best of my ability, but to no avail. Mare lingered in much agony for 4 days, at the end of that period she succumbed to injuries received. Post-mortem carefully made thoroughly bore out diagnosis as to mechanical congestion due to oil, etc.

ABSTRACTS FROM FOREIGN JOURNALS.

Injections of Air in Milk Fever.—By M. Bergstrand.

Statistics show that a cure is obtained in 80 to 85 per cent. of cases following the treatment of Schmidt. Dilute injections of Lysol (*d'eau lysolée*), of boiled water, followed by injections of air give equally good results. As for injections of air alone in cows recently attacked, their value is unequalled—every case recovers.

Jacobsen has used air only, to the exclusion of all other procedures, in 150 cases, and with complete success.

Bergstrand: In 36 cases (25 of them my own, 8 by Holm, the other 3 by Hyden) 34 were subjected to early treatment by air alone, 34 were cured; the recoveries taking place in general in less than five hours. The two cases which terminated fatally were complicated by pneumonia. The treatment in these cases was mixed. At first iodised water was injected. The injections of air were tried when the cases were too far advanced.

[M. Bergstrand's note is accompanied by a report by Almgren upon 8 cases of milk fever treated with iodide of potassium associated with injections of air; all of them were cured. The recoveries were slower than in treatment by air alone, one of them was not established until the third day.]—*Revue Générale de Médecine Vétérinaire.* Ex. *Svensk Veterinärtidskrift, Fevrier, 1903.*

Anti-Aphteuse Therapy, By M. le Professeur Nocard, d'Alfort.*

Each year, for the last ten years, the Concours General Agricole has been the starting point for a small outbreak of Aphthous Fever (Foot and Mouth). Each year several exhibitors, in varying numbers, see the malady appear amongst the animals which they have brought back from the Show; and often, in spite of precautions taken, in spite of the quarantine that most of them are in the habit of imposing on those animals before returning them to the common stable, the malady spreads to other animals on the farm, then to those of neighbouring farms. How is it possible for the animals exhibited to have carried the germs of the disease to the Concours? Every precaution is taken to avoid the admission of ailing or infected animals: only animals provided with a certificate declaring not only that they are healthy but that aphthous fever does not exist in the district from which they come, and that it has not existed there for at least six weeks within a radius of six kilometres. Moreover, on arrival each beast is subjected to a close individual examination permitting the assurance that it is perfectly healthy.

All these measures, very well conceived, very well carried out, allow us to affirm that no animal admitted to the Show is infected with aphthous fever—even in the germ: and this is evidenced by the fact that the malady never appears at the commencement of the gathering. On the contrary, it is only in the last days, on the closing day, or the day before, that the disease is noticed, and it attacks only a small number. In some years, indeed, not a single case has been detected during the Show; nevertheless several exhibitors have complained that their animals showed signs of the disease as soon as they were returned to the fold. Even in the cases in which the disease has been noted at the Show the number of animals affected was always incomparably less than the number of centres created in the country by animals returned from the Show. Thus it is certain that numbers of animals, healthy in appearance when leaving the Show, carry with them the germs of the disease.

How, then, does the disease occur in spite of the precautions taken?

It seems to me certain that we must incriminate the thousands of visitors who are admitted during the last days of the Show. Amongst them are numerous owners of animals, cultivators, butchers, and dealers who handle the animals on show as *connaisseurs* or as buyers, and may convey the germs of the disease from an infected stable on their hands, on their clothes, or on their boots.

It is from this ever-present danger that we desire to protect you, and it is in order to define exactly the limits and the duration of this protection that I have gladly accepted this opportunity for conference.

It is now nearly two years since M. Jean Dupuy, then Minister of Agriculture, commissioned Dr. Roux and myself to attack the difficult problem of prophylaxis of aphthous fever, and placed at our disposal

* Conference held at the Concours General Agricole. Reported by M. H. Vallée.

all the material aids that we were likely to want. In these laborious researches we have associated with us two of our best pupils MM. Vallée and Carré. For nearly two years we have done our best, all four of us, but we have now to own that we are scarcely further forward than when we started.

The microbe of aphthous fever has up to now escaped all our research—as it has those of our predecessors. This invisible agent, so abundant in the products that the serosity diluted to 1 : 10,000 is capable of conveying the disease, we have neither been able to see, nor to cultivate outside the living organism. That we have been unable to see it is nothing astonishing since it can pass through the pores of the densest porcelain filter. Indeed it may be beyond the limits of visibility. That would not be a matter of great importance if it would consent to increase and multiply in our artificial cultures. The check in this direction is to be deeply regretted. For, once we have mastered the specific agent of a contagious malady we have many chances of soon mastering the malady itself. We have many chances of success in attenuating the virulence of the microbe by way of transforming it to a vaccine. If even one comes to grief in that direction—and a vaccine is the ideal of prophylaxis—the possibility of obtaining large quantities of virulent culture renders easy the production of an effective serum, either preventive or curative. Marvellous results have been obtained from serotherapy in the struggle against diphtheria, bubonic plague, rinderpest, rouget du porc, and against tetanus.

So far we have failed in these two principal objects of our research. Possibly we may never succeed in attaining them. For seven years one of the first bacteriologists of Germany, Professor Löffler, has been yoked to this heavy load, and up to the present he also has been unable to find the solution of the problem.

Our efforts have, nevertheless, not been entirely sterile. We have demonstrated, as Löffler and many others have done, that the serum of animals recovered from a severe attack of aphthous fever possesses a definite immunising action; inoculated in large doses to clean animals it increases to an appreciable extent their natural resistance to virus subsequently inoculated; it diminishes the severity of the attack thus produced, and sometimes, if the dose injected is sufficient, it prevents the appearance of the malady. But the action of this serum is so feeble that to produce this result the injection of 500, 800, or even 1000 c.c is necessary.

We have also demonstrated, like Löffler, that by reinforcing the immunity of animals recovered from a severe attack, by injecting at different times large quantities of aphthous virus, we can considerably increase the preventive and curative value of the serum, and we have thus obtained a serum of such activity that a dose of 20 c.c. injected to clean bovines protects them with certainty from the effect of a dose of virus much larger than that which produces the disease with certainty in control animals. These results, repeated many times in the laboratory, have been fully confirmed under the conditions of practice.

For example, last year aphthous fever was detected at the Concours General Agricole, in two animals, belonging, one to M. Maitrol, of Montmire la Ville, the other to M. Tattigney, of Magny, Côte d'Or; it was the eve of closing the Show. Fifteen other animals, belonging to the same proprietors and looked after by the same attendants, received injections of our serum. Not one of these took the disease; it is more than probable that some of them already carried the germs of the disease at the time they were injected; the serum prevented its development. The animals known to be infected were exhibited amongst others belonging to different owners; most of these consented to preventive inoculation for their animals, and in all 90 bovines received doses of the serum; *not one of these 90 animals became aphthous.* But, we learnt that amongst the exhibitors ten had their lands infected some days after the return from the show. The 90 animals inoculated were distributed in all sections of the show, amongst those which ultimately developed the disease; they were exposed to the same risk of infection; I have surely the right to claim that their escape was due to the serum injected.

[After quoting several similar cases, in all of which the inoculated animals escaped the disease, M. Nocard continues:]

In conclusion, here is another example which occurred in July last. A large breeder, of Orne, M. Corbière had aphthous fever in certain of his grazings. Fearing infection of the whole of his stock, he asked us to treat the more valuable of the animals. M. Carré went there and injected 80 beasts. This is what M. Corbière says as to results.

"I am glad to announce that up to now the success has been complete. The animals treated, mixing with others which have taken the disease, have not become affected. Aphthous fever is very bad here; I have lost, yesterday and the day before, two beasts of 2½ years; two cows treated which are in the same lot remain absolutely free.

"The rams inoculated are not attacked, whilst all the ewes in the same fold are ill.

"In one lot of six bulls, five had received the serum, the sixth, left as a control, has alone taken apthous fever.

"My milch cows, which I value so much, remain free.

"Altogether, out of 80 beasts injected not one has yet been attacked, whilst elsewhere all over my land the disease is increasing."

Why not apply generally a treatment which gives so good results?

Why? I will tell you; and it is principally to tell you this that I have accepted this conference.

The serum is very effective; that is an assured fact. Its protective action is immediate, but, like all serums, the immunity conferred is very brief—scarcely 15 days. After 15 days most of the animals injected are liable to contract the disease afresh.

Just think of the number of animals which in the smallest epidemic should receive every 15 days at least an injection of 20 c.c. of serum, and calculate the quantity of serum required! Under the present conditions of production of the serum the thing is practically impossible. It would become possible,

though still difficult, if we could obtain a culture of the microbe. We can only dream of that.

The results we have obtained are a minimum compared to those which we can see but are unable to attain, but small as these results are we think that we ought to reap the possible. At the general or local shows it is not a question of fighting an epidemic, but simply to prevent the creation of fresh centres. It is not a question of immunising the animal population of a region figuring out at tens of thousands; it is simply to inject a few hundred animals, and that is not beyond our reach. — *Revue Générale de Médecin Vétérinaire.*

W. H. B.

PARASITIC INFLAMMATION OF THE FOURTH STOMACH IN RUMINANTS.

From the Annual Report for 1902 of Royal Veterinary College.

During the past year a considerable number of cases of this disease in sheep (Lincolnshire lamb disease) came under notice, though it does not appear to have prevailed to the alarming extent which characterised the autumn and early winter months of 1895 and 1896. On the other hand, an unusual number of cases of the like condition in cattle came under observation, and as the principal facts regarding the disease are not yet so well known as they ought to be, it appears to be desirable to refer to them here at some length, although that has already been done in previous reports.

Although it is only within the last few years that the disease has been recognised and received a special name, it probably has no claim to be considered a new complaint. As a special disease of cattle it has probably escaped notice, because it has generally been confounded with tuberculosis. It cannot be said that there ever was much justification for confounding the two diseases, for there is only a slight resemblance between them in respect of symptoms and none whatever in the matter of lesions.

The symptoms of parasitic gastritis in cattle may be adequately described within very short compass. The earliest symptom is an appearance of unthriftiness, which soon marks the animal out from the other members of the herd. In Devons and other animals with a red coat, the hair is noticed to have acquired a yellowish tinge, especially along the back. The unthriftiness increases gradually, until it has passed into a condition of positive emaciation. Coincidently with the loss of condition, or soon afterwards, diarrhœa sets in, and unless checked by medicines this becomes more and more profuse, and persists till death. A fact of great importance for diagnosis is that the diarrhœa and emaciation are not accompanied by any failure of the appetite, which may even be voracious until near the end. It is also important to note that there is no disturbance of the circulation or respiration, and that the temperature is normal. Occasionally there may be a little dropsy of the dewlap and beneath the throat, but as a rule there is none. Eventually the animal becomes so weak that it is unable to rise, and it is then usually killed. That is generally from three to six months after the first symptoms are noticed.

A layman may be tempted to say that the foregoing description accords pretty well with what is popularly understood by the term "consumption," and that, contrary to what has been said above, there appears to be ample excuse for confounding the disease with tuberculosis. It is, however, nearly always easy to distinguish between the two diseases, even while the animal is still alive, and the two points that are of main importance in this connection are the following. In the first place, diarrhœa is a constant symptom in parasitic gastritis, and it is absent in the great majority of cases of tuberculosis. Secondly, when tuberculous disease has advanced to such a degree as to induce marked emaciation, and to set up diarrhœa, cough and other signs of chest trouble are almost invariably present.

What has just been said refers to the means by which one may with only a small chance of error diagnose this disease while the animal is still alive, and a word or two must now be said regarding the diagnosis after death. When a post-mortem examination is available it is, or at least it ought to be, impossible for anyone to mistake parasitic gastritis for tuberculosis. When an animal has actually died from the latter disease, or been killed when near the point of death, the most careless observer could not overlook the presence of the tubercles and other structural alterations that are characteristic of that disease, for no animal is ever killed by tuberculosis or even made visibly ill by it while the disease is still of microscopic extent. In advanced cases the lesions are always so conspicuous that they force themselves on the attention as soon as the body is opened.

On the other hand, in a case of parasitic gastritis, unless the person making the post-mortem examination knows precisely what organ to examine, and what to expect there, he is very likely to be much puzzled, for, apart from the thinness of the blood and the absence of fat throughout the body, all the organs with one exception may appear to be perfectly normal, and even this exceptional organ might pass for healthy to a casual observation. The constant seat of disease is the fourth or true digestive stomach, and the cause of the disease is the presence in this organ of parasitic worms, which, although not exactly microscopic, are so small that the sharpest vision is unable to detect them in the stomach contents. The lining membrane of the stomach rarely presents any very marked signs of acute inflammation. There may be a little congestion at some places, but frequently the mucous membrane is abnormally pale, and in the worst cases its folds are thickened to a remarkable degree by a thin clear watery liquid, which drains away from them when they are cut across. The worms are readily detected when the stomach contents or scrapings from the mucous membrane are examined under a low power of the microscope. Two different species of worms appear to be responsible for this trouble, and in a considerable number of cases both species are found to be represented in the same stomach. The smaller species is named the *Strongylus gracilis*, and the larger species the *Strongylus convolutus*. Worms of both sexes and eggs are found in the stomach, but the latter pass into the intestine, and either they or the embryos hatched from them are discharged with the excrement. In this way the pasture on which such scouring animals are kept becomes contaminated, and fresh cases of the disease are produced.

That the disease is far from rare may be inferred from the fact that during the last twelve months animals so affected from seven different farms were admitted to the College Infirmary for post-mortem examination or experimental treatment, and in a number of other cases the disease was diagnosed by the examination of stomachs sent to the Laboratory.

In previous reports attention has been called to the intractable character of the disease, and it must be admitted that the recent attempts to effect a cure have been no more successful than the earlier ones. During the past year animals have been treated with large doses of thymol and lysol, but both these substances appear to be powerless to effect a cure when emaciation has set in before the treatment is begun. The following may be cited as an example of the futility of treatment, at least in advanced cases. On November 3 last, half

an ounce each of thymol and chloroform, dissolved in equal parts of warm methylated spirits and water, was administered by means of the stomach pump to a heifer affected with the disease. Ten days later, one ounce of thymol similarly dissolved was administered in the same way, but in spite of this and a liberal diet, the heifer steadily lost condition, and owing to inability to rise it had to be killed on December 10. The post-mortem examination confirmed the diagnosis, numerous live worms being found in scrapings from the mucous membrane of the fourth stomach. At the present time, however, the most economic plan would appear to be to dispose of affected animals to the butcher as soon as the condition is recognised. It is important to remember that if treatment is adopted the diseased animal ought to be kept indoors, and the manure ought to be destroyed.

J. M'FADYEAN.
Royal Veterinary College, London, N.W.

RECENT STUDIES OF IMMUNITY WITH SPECIAL REFERENCE TO THEIR BEARING ON PATHOLOGY.

THE HUXLEY LECTURE.

By WILLIAM H. WELCH, M.D., LL.D., Professor of Pathology, Johns Hopkins University, Baltimore.

(Continued from p. 659)

I shall ask your attention now to some considerations concerning the bearing of recent studies of immunity on the nature and action of toxins, a subject which is, of course, of the greatest pathological as well as bacteriological importance. The discovery by Roux and Yersin of the diphtheria toxin, the studies by Behring and Kitasato of tetanus toxin, leading up to Behring's epochal discovery of antitoxin and the later investigations of Ehrlich on the constitution of diphtheria toxin and the origin and mode of action of antitoxin are the great events in the most brilliant and securely founded chapter of modern studies of immunity. Through these researches we became acquainted with a class of poisons secreted by certain bacteria and present in solution in culture fluids. The evidence is conclusive that these soluble toxins enter, as assimilable substances, into direct combination with constituents of the body cells for which they have an affinity, and only thereby are enabled to bring about immunity or to exert toxic effects. As shown by the modifications of toxins called toxoids, the toxic property may be destroyed without loss of the combining power and without removal of the immunising power. According to Ehrlich's helpful conception, based on a large amount of experimental evidence and now very generally accepted, the combining power of the toxin molecule resides in a group of atoms, designated as the haptophore group, with affinity for the corresponding haptophore groups of the side-chains or receptors of cellular constituents, and the toxic power pertains to another and less stable atomic complex in the molecule. By means of these facts and legitimate deductions from them we are enabled to explain in a satisfactory way susceptibility to poisoning by these soluble toxins, their selective action upon the cells of the body, and their quick disappearance after injection into the circulating blood. In one infectious disease, and in one only, to wit, tetanus, are we able to explain the clinical and pathological phenomena in minute detail on the basis of our knowledge of the causative micro-organism and its poisonous products. The nearest approach to this example is diphtheria, but here we have not yet been able to follow the trail of the toxins within the body so perfectly, and, as Flexner and I have shown, in addition to the soluble toxins there is an intracellular poison concerned in the production of the false membrane. Interesting investigations, which have greatly helped to elucidate the nature of these toxins, have been made on various similar vegetable and animal poisons, such as ricin and abrin from the former source, and the venom of snakes, spiders, and other poisonous animals.

The high hopes which were raised by the discovery of the soluble bacterial toxins that at last the way was opened for us to penetrate into the mysteries of the mode of action of pathogenic bacteria were soon doomed to disappointment, for similar powerful toxins, though diligently sought, could not be detected in the cultures of most other bacteria, and these among the most important ones, such as the tubercle bacillus, the typhoid bacillus, the cholera spirillum, the pneumococcus, and the pyogenic micrococci. This disappointment was all the more acute because there was, and is, every ground for confidence that whenever we have in our possession a powerful toxin of this class a strong protective antitoxic serum can readily be obtained. Notwithstanding these negative results the belief was not abandoned that bacteria harm the body mainly by poisoning, for it rests upon strong clinical and pathological evidence, as well as upon the study of the distribution of bacteria in the infected body. The search for poisons was turned from the fluid part of cultures to the bacteria themselves and thus Pfeiffer succeeded in demonstrating as an integral constituent of the bodies of cholera spirilla toxic substances which are liberated only when the bacteria degenerate or die. Intracellular poisons, which indeed previously, though of a different nature, had been extracted from bacteria by Buchner and by Koch, were subsequently found within typhoid bacilli and a number of other pathogenic bacteria.

It is of more than purely bacteriological interest to recognise the distinction between the small group of pathogenic bacteria, represented by the bacilli of tetanus, of diphtheria, and of botulism, characterised by the secretion of powerful soluble toxins, and the much larger group, containing most of the other pathogenic bacteria, which do not secrete similar strong toxins, for it is only the former which give rise to the production of antitoxic sera of marked protective and curative power. The form of immunity resulting from injections or natural infections with the second class of bacteria belongs mainly to the bacteriolytic type, in which the complete anti body is not a single substance like anti-toxin but is composed of two distinct elements, intermediary body and complement, of which only the former is produced or increased in the process of immunisation. The bacteriolytic sera are also under suitable but not readily controlled conditions protective and curative, but owing, it would seem, mainly to the duplex nature of the anti body their successful therapeutic application meets difficulties which have not yet been overcome. The great practical problem of bacteriology to day is to make available to medical practice the bacteriolytic sera, such as anti-typhoid, anti-pneumococcic, and anti-streptococcic, anti-plague, and anti-dysentery sera. Such work as that of Marmorek, of Wassermann, of Neisser and Wechsberg, and of Ainley Walker upon the production, the properties, and the conditions underlying the action of these sera is therefore highly important.

Our knowledge of the constitution and action of the intracellular bacterial poisons is most incomplete and at present cannot be applied in any very definite and satisfactory way to the explanation of the morbid phenomena of infectious diseases. Such investigations as those undertaken by Macfadyen and Rowland at the Jenner Institute of Preventive Medicine upon the expressed juices of bacterial cells promise to shed light upon this subject and in general upon the vital processes of bacteria. I find it difficult to reconcile myself to the doctrine that bacteria such as the typhoid bacillus, the pneumococcus, and others of the class now under con-

sideration, do their chief injury to the body, not while they are lively and vigorous, but after they become corpses and in consequence set free their protoplasmic poisons. Still, this latter conception is the basis of a coherent hypothesis of infection, elaborated most fully recently by Radzievsky, which rests upon a considerable amount of accurate observation and interesting experimental work. There can be no doubt that in the course of many infections there goes on an enormous destruction of the bacteria concerned, so that the numbers of those indicated at any given time by microscopical examination and by cultures may represent only an insignificant fraction of the total progeny of the first invaders. I have been much interested in this phenomenon since I became familiar with it over 12 years ago in pneumococcic infections, through the employment of a method which revealed in the exudates degenerating and dead pneumococci and their empty capsules in numbers often far exceeding the intact organisms—indeed, in some cases so many that they formed a large part of the exudate.

While all due weight should be given to such facts as these the objections to the acceptance of the hypothesis just mentioned as affording a complete explanation of the toxic phenomena of this class of infections are so obvious that naturally efforts have been made to learn whether bacteria which produce no strong soluble toxins in our ordinary culture media may not do so on other media of special composition or in a demonstrable way within the living body. Work in these two directions has not been altogether barren, as shown by results of experiments made by Hueppe, Cartwright Wood, Marmorek, and others, along the former lines, and by Metchnikoff, Roux, and Salimbeni, along the latter, but it cannot be said that these experiments have led to any generally accepted solution of the main difficulties. Some are therefore inclined to lay the chief emphasis upon disordered cellular metabolism, but this is only a restatement of the question. Everybody recognises abnormal metabolism as an essential condition in infections. The very point needing explanation is how the bacteria derange metabolism.

I wish here to advance a hypothesis which seems competent to explain the source, the mode of production, and the nature of certain bacterial toxins. It would appear to be a natural inference from the receptor theory of Ehrlich and the recent work on cytotoxins. The following considerations will, I hope, make clear the essential points.

As I have already stated, we know that the injection of foreign cells, such as pathogenic bacteria, red blood corpuscles, spermatozoa, and epithelium, into the tissues of an animal leads to the formation of poisons called cytotoxins acting specifically upon these cells; that the substances which stimulate the cells of the host to produce one constituent of this class of toxin consist of certain atom-complexes derived from the injected cells; that certain cells of the host thus stimulated generate and discharge one component of the toxin called the intermediate body, which, although by itself not poisonous becomes the medium of intoxication through union, on the one hand, with a pre existent toxophor substance, called the complement, and, on the other hand, with the foreign cell which started the reaction. Such is the response on the part of the host to the entrance of the foreign cells; but how about a possible response of a like nature on the part of the invading cells towards the host, resulting in the production of special cytotoxins, of analogous constitution, injurious to the host? This latter response, being of a vital nature, can take place only when the invading cells are living, as in the case of bacteria and other parasites. I see no reason why suitable substances derived from the host may not stimulate parasitic organisms, through a physiological mechanism similar to that operative in the development of cytolytic immunity, to the production of intermediary bodies which, if provided with the requisite affinities, have the power to link complements to cellular constituents of the host and thereby to poison the latter. Expressed in terms of Ehrlich's side-chain theory, certain substances of the host of cellular origin, assimilable by the parasites through the possession of haptophore groups with the proper affinities, become anchored to receptors of the parasitic cell, which, if not too much damaged, is thereby stimulated to the over-production of like receptors; these excessive receptors of the parasite, if cast off into the fluids or the cells of the host, constitute intermediary bodies or amboceptors with special affinities for those cellular constituents or derivatives of the host which led to their production and for others which possess in whole or in part identical receptors. Provided the host is supplied also with the appropriate complements there result cytotoxins with special affinities for certain definite cells or substances of cellular origin in the host. The contribution of the parasitic cells to these cytotoxins is the amboceptors. Either the parasite or the host may provide the complements.

It may perhaps aid in grasping the ideas here presented to imagine the bacterium, in the capacity of the host, as a structure so large that one could inject into it animal cells. Provided the proper receptor apparatus is present, the resulting reaction on the part of the bacterium, as described, would be a process of immunisation against the animal cells through the formation of specific cellulicidal substances. In reality it is only certain atomic complexes of cells which are concerned in this immunising reaction, and in comparison with these even the smallest bacterium is a gigantic object. Looked at from the point of view of the bacterium as well as from that of the animal host, according to the hypothesis advanced, the struggle between the bacteria and the body cells in infections may be conceived as an immunising contest in which each participant is stimulated by its opponent to the production of cytotoxins hostile to the other, and thereby endeavours to make itself immune against its antagonist. These mutually antagonistic cyto-toxins are capable of injuring the parasitic cells, on the one hand, or the body cells on the other, only when, escaping combination outside of them, they are anchored to the receptors of the cells to which their respective affinities are adjusted. This combination with the cells, if it does not result in too great injury to them, is the condition for further production of the cytotoxic intermediary bodies through over-production and discharge of receptors.

The important factors determining the issue of the contest are the relative proportions and the distribution of the bacterial and the host's cytotoxins. The hypothesis thus outlined can be tested experimentally, but I regret that it has shaped itself in my mind so recently that I have not yet been able to make the desired experiments, which are, however, now started in my laboratory. Since my arrival here I am informed that these experiments have already furnished facts in its support which will be published later.

[Professor Welch here enumerated several theoretical considerations which support his hypothesis. He then at considerable length discussed the action of snake poison (venom toxins), chiefly in the light (1) of the researches of Flexner and Noguchi now in progress, of which only the first part has been published, and (2) of the researches of Preston Kyes. Other workers in this field have been Weir Mitchell, Reichert, Sewall, Calmette, and Fraser. Flexner's investigations were made in his laboratory in the University of Pennsylvania. The results obtained by him and Noguchi necessitate a conception of the nature and manner of action of venom toxins quite different from that previously entertained and they show that the toxic action of venom upon red blood corpuscles, lecucocytes, nerve cells, and other cells

is like that of the duplex cytotoxins already described. Preston Kyes, a former pupil of Professor Welch, working in Professor Ehrlich's laboratory, confirms the conclusions of Flexner and Noguchi concerning the amboceptor nature of venom and adds much to our knowledge of the subject. The objections made by Calmette to Flexner and Noguchi's interpretation of their experiments as to the amboceptor nature of venom have been completely overthrown by the experiments of Preston Kyes. That snake venom should contain only one half of the complete poison, the other and the really destructive half being widely distributed in the blood and cells of man and of animals, is an instance of a curious kind of adaptation, of interest from evolutionary as well as other points of view. Professor Welch then made a reference to several bacteria toxins, especially the hæmolysins, discovered by Ehrlich in 1898, after which he continued as follows :—]

In view of the abundant clinical and pathological evidence of extensive destruction of red corpuscles in the course of many infectious diseases, it is certainly significant to find that many bacteria are endowed with a specific hæmolytic power. The question is how far we are justified in applying to the actual conditions of infection the existing experimental data upon this subject. Assuredly here, as everywhere, results of test-tube experiments, helpful in suggestion as they may be, should not be utilised without further evidence to explain morbid phenomena within the infected human or animal body. While much more work upon this subject is needed before our information will be exact or complete the observations and experiments of Besredka, Kraus, and Ludwig and others have already demonstrated that bacteria may exert their blood-destroying power within the living body. This hæmolytic capacity of microorganisms affords an explanation, although certainly not the only one, of the secondary anæmias which are such a marked feature of many infectious diseases, as streptococcic and other septicæmias, pneumonia, typhoid fever, scarlet fever, and others. The hæmoglobinuria which is a recognised although rare complication of various infectious diseases may be referable to intoxication with unusually powerful bacterial hæmolysins or to an exceptional lack of resistance of red corpuscles. Hæmoglobin, however, is not necessarily present in solution in the blood plasma, for the destruction of the damaged red corpuscles may take place within the large phagocytes of the spleen and hæmo-lymph glands, as is well known to occur on an extensive scale in typhoid fever and some other infections. A familiar example of the action of bacterial hæmolysins is the post-mortem reddening of the inner lining of the heart and blood vessels, an effect which may be due to putrefactive bacteria or may appear very soon after death, especially from septicæmia caused by streptococcus pyogenes which, as has been shown, may lake the blood during life.

The fact that certain common saprophytic bacteria may produce energetic hæmolysins, as pointed out by Kraus and Clairmont and by Todd, has a possible bearing upon the etiology of certain obscure anæmias not of infectious origin, particularly upon the interesting observations and the theory of William Hunter concerning their causation by absorption of toxins from the alimentary tract. Todd found cultures of bacillus megaterium so strongly hæmolytic that the intravenous injection of one cubic centimetre of the filtrate into guinea-pigs was followed by hæmoglobinuria, 10 cubic centimetres being fatal. Human red corpuscles are sensitive to this hæmolysin.

Normal human and other blood sera contain in varying amounts anti-hæmolysins, which protect the red corpuscles from the action of some of the bacterial hæmolytic agents. Specific anti-hæmolysins are readily produced by immunising injections of bacterial hæmolysins and are generated also in the course of infections. Lang suggests that the augmentation of the osmotic resistance of the erythrocytes which has been noted in some infectious diseases, as well as in icterus and some other morbid conditions, may be a reactive phenomenon caused by the presence of hæmolytic toxins.

Intimately associated with the hæmolysins in cultures are the bacterial hæmagglutinins, substances which have the power to clump red blood-corpuscles. Among unicellular organisms both the capacity to produce agglutinins and the aptitude for agglutination seem to be very widely distributed. The bacterial hæmagglutinins, in analogy with the bacterial hæmolysins, are apparently of simpler constitution than the serum agglutinins, being destroyed at 58° C., whereas the latter are not injured by temperatures under 70° C. In order to demonstrate in cultures the hæmagglutinins it is generally necessary to eliminate in some way the action of the associated hæmolysins, which can be done by using small quantities of the culture fluid or by keeping the mixture of fluid and red corpuscles at zero temperature.

I know of no observations directly demonstrative of the action of bacterial hæmagglutinins within the living body in infections, but this subject is of such recent knowledge that it has been as yet scarcely investigated. Certainly, there are morbid conditions which seem highly indicative of the operation of substances agglutinative of red corpuscles. Probably everyone with large experience in the examination of fresh blood in disease has noticed that sometimes red corpuscles examined immediately after withdrawal of the blood have a peculiar tendency to form clumps which cannot readily be broken up. This phenomenon, which is certainly suggestive of the action of an agglutinating agent, I have observed especially in some cases of septic infections and of cirrhosis of the liver. Furthermore, I would emphasise the support given by the recognition of hæmagglutinins to views advocated many years ago by Hueter and by Klebs concerning the occurrence of thrombi composed of coalesced red blood corpuscles. Such thrombi I believe to be not uncommon in typhoid fever and other infections, especially in small blood vessels. I have elsewhere called attention to the evidence in favour of the interpretation of many of the hyaline thrombi as derived from agglutinated red corpuscles.

[Professor Welsh here continued his discussion of bacterial and animal toxins, mentioning with regard to the causation of the lesions of typhoid fever his suggestion that the typhoid bacillus produces a lympho-cytotoxin and a hæmolysin, and that the proliferation of the fixed cells is partly compensatory and partly for the increased production of macrophages. He quoted the work of Levaditi, Neisser and Wechsberg, Flexner, Fisher, Muscatello and Ottaviano, Belfanti and Carbone, and several others, after which he proceeded as follows :]

It is especially gratifying to note the close convergence of the two doctrines of immunity, the cellular and the humoral, brought about by these recent discoveries. On the one hand, the phagocytic school, represented so brilliantly by Metchnikoff and his co-workers in the Pasteur Institute, recognise and apply to the fullest extent in the explanation of acquired immunity the cytolytic principles based upon the co-operative action of intermediary bodies and complements. On the other hand, the humoral school, led by our German *confrères*, which has been so fruitful in results of the greatest scientific and practical value recognise the cells and especially the leucocytes and other cells of the blood-forming organs, as the immediate source of the protective substances. There are many differences in details, especially in terminology and in interpretation, which make the divergence seem greater than it really is. The essential difference between the two schools concerns the place where the two forces, intermediary body and complement, unite. All are agreed that the intermediary body exists free in the blood plasma, but Metchnikoff

strenuously insists, especially on the basis of Gengou's experiments, that the complement or cytase is within the leucocytes, from which it is not secreted but can be liberated only through damage to these cells. This question certainly needs further investigation before it can be regarded as settled.

The deeper insight which we have recently gained into the nature of the forces concerned in immunity makes especially desirable the systematic study of the blood and other fluids of human beings in health and in disease with reference to their content of specific anti bodies, particularly of the bactericidal substances. It can scarcely be doubted that knowledge of this kind will be in various ways of practical value to the physician and surgeon. The simplest procedure, and the one hitherto generally adopted, is the estimation of the bactericidal power of the blood serum *in toto*. For this purpose Professor A. E. Wright has devised an ingenious method which in his hands has furnished extremely interesting information concerning variations in the bactericidal power of the blood as regards the typhoid bacillus in health, under the influence of fatigue, in the course of typhoid fever and after anti-typhoid inoculations. The older methods, however, while not without value, do not inform us of the total contents of the blood in immunising substances, and have led to very discordant results, particularly as to the influence of infection upon the bactericidal power. Thus Conradi finds, in opposition to most previous experimenters as well as to the later results of Wilde, that infection with the anthrax bacillus does not at any stage influence materially the bactericidal properties of the blood.

A useful and readily applicable method for the determination separately of the intermediary bodies and of the complements of human serum is urgently needed. When one takes into consideration the plurality of complements and of intermediary bodies, the fallacies of interpretation which may arise from failure to take account of anti-complements, of anti-immune bodies, of complementoids, of amboceptoids, of deviation (*Ablenkung*) of complements, and other principles in this complicated subject, it is clear that the problem is not an easy one. Notwithstanding these difficulties work has already begun along these new lines and has led to interesting results. We know that the content of the blood in specific anti bodies, and especially in complements, varies in significant ways under diverse conditions, as in infancy and in adult life, in health, in different states of nutrition, under the influence of fatigue, of inanition, of pain, of interference with respiration, of alcohol, and in disease. The infant comes into the world with protective anti-bodies in the blood smaller in amount and less energetic than those possessed by the healthy adult. It is an important function of the mother to transfer to the suckling through her milk immunising bodies, and the infant's stomach has the capacity, which is afterwards lost, of absorbing these substances in an active state. The relative richness of the suckling's blood in protective anti bodies, as contrasted with the artificially fed infant, explains the greater freedom of the former from infectious diseases.

The important question of the influence of pre-existent disease in predisposing to infection has been brought nearer to a solution by recent studies of immunity. Schütze and Scheller have demonstrated that, while the normal rabbit promptly regenerates the complements used up in consequence of the injection of hæmolytic serum, a rabbit infected with the hog cholera bacillus has lost this capacity. My former pupil, Dr. Longcope, has kindly placed at my disposal the unpublished results of an investigation which he is making under Prof. Flexner's direction at the Pennsylvania Hospital, of the intermediary bodies and the complements in human blood in different diseases. Colon and typhoid bacilli are used as the tests, as unless one accepts Bordet's doctrine of the unity of complements, it is more important for the study of problems of infection to determine bacteriolytic rather than hæmolytic anti-bodies. One of the earliest results of the systematic bacteriological examinations which we make at all necropsies at the Johns Hopkins Hospital was the recognition of the great frequency of terminal infections, formerly often undetected by the clinician, in chronic diseases, particularly of the heart, the blood vessels, and the kidneys. Dr. Longcope finds, although not regularly, still in many cases of these diseases, a marked reduction in the quantity of complements, which may amount to a total loss of the colon complements. The analysis of the cases brings out unmistakeably a definite relation between this loss of complement and the predisposition to infection. The study of a series of acute infections, chiefly of a surgical nature, shows that in the course of the infection complements are being constantly used up and regenerated, and that at any given time there may be an excess or a reduction of the bacteriolytic power of the blood. Thus far it has been found impossible in these acute infections to attach any prognostic significance to the amount of complement or of bacteriolytic power, nor could any definite relation be determined between the leucocyte count and the content of complements.

The researches on immunity, which to some of short vision once seemed to threaten the foundations of cellular pathology, have served only to strengthen them. These researches, which have already led to the saving of thousands of human lives and will lead to the saving of untold thousands more, have been carried on by the experimental method and can be conducted in no other way. This method is as essential for the advancement of medical science as for that of any of the natural or physical sciences. To restrict unnecessarily and unjustifiably its use is nothing short of a crime against humanity. It is an evidence of the robust vitality of English physiology and medicine that in spite of unwarrantable obstacles thrown in their path their contributions to science in recent years have been so numerous and so important. The influence of English thought and action is great with us in America. See to it, my colleagues and men of science in these British Isles, that you retain for yourselves and hand down to your successors at least without further impairment the means of promoting medical knowledge and thus of benefiting mankind.—*The Lancet.*

Royal College of Veterinary Surgeons.

A Special Meeting of Council was summoned for Thursday, April 16th, to confirm the undermentioned alteration of bye-law passed at a special meeting held on the 3rd inst.: "To amend Rule 10 of the Regulations for the Walley Memorial Prize by the omission of the words 'Four of which must be attempted." The following members were present: Vet. Col. Duck, Professors Penberthy and Shave, Messrs. Mulvey, Simpson, and Wragg; Mr. Thatcher (Solicitor), and Mr. Hill (Secretary).

Messrs. Carter, Mason, M'Fadyean, and McKinna sent letters regretting their inability to attend the meeting.

Seven members of Council forming a quorum, and only six being present, no meeting was held.

DISEASES OF ANIMALS ACTS 1894 & 1896.

Summary of Returns, Week Ending April 18, 1903.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies.		Swine Fever.	
							Cases Confirmed.			
	Outbreaks	Animals Attacked.	Outbreaks.	Animals Attacked.	Outbreaks.	Animals Attacked.	Dogs.	Other Animals	Outbreaks.	Slaughtered as Diseased or Exposed to Infection
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended April 18, 1903 ..	16	20	..	..	32	48	..	..	30	206
Corresponding week in 1902 ..	13	19	..	8	31	49	..	..	22	100
Corresponding week in 1901 ..	26	38	..	5	29	39	..	..	117	712
Corresponding week in 1900 ..	11	15	1	21	29	38	..	..	50	620
Total for 16 weeks, 1903	257	391	..	..	384	659	..	..	438	2,077
Corresponding period in 1902 ..	242	413	1	119	365	688	9	..	480	2,423
Corresponding period in 1901 ..	224	341	12	665	387	658	1	1	935	4,535
Corresponding period in 1900 ..	179	283	8	120	337	609	..	..	563	6,574

Note.—The figures for the Current Year are approximate only.

Board of Agriculture, April 21, 1903.

THE STORY OF CRUELTY CAMP.

By George Griffith.

We take these extracts from a long article in *The Daily Chronicle*. Of course the "veterinary" staff is mentioned—but why?

"The Albert District of Cape Colony is, roughly speaking, included in a square formed by the thirtieth and thirty-second parallels of south latitude and the twenty-fifth and twenty-seventh meridians of east longitude. For generations it has been recognised as the finest horse raising country in South Africa. When the war broke out it contained some fifteen thousand horses, mares and foals of the best Colonial stock from the point of view of practical utility. These animals were located on farms averaging eight thousand acres, with a grazing capacity of two hundred horses each—that is to say, a farmer who knew his business would not put more than two hundred horses on this area in 12 months.

On April 10, 1901, the order went forth from headquarters that within a fortnight all horses in the district were to be brought into "Protection Camps," the theoretical object of which seems to have been to protect the farmer's stock from marauding Boers, and to prevent the enemy from getting remounts and spare horses. Subsequently an order of May 19 extended this time to 21 days in consideration of the distances the animals had in many cases to be brought. They were to be taken in the first instance to the Remount Department, where the officers in charge of the camp had the right to take all trained horses that they considered fit for service, and for these they paid from four to five pounds each, the then market prices of such animals being from £20 to £25 per head."

"The farms were swept clear of all horses, mares, and mules, and after the remount officers had taken their pick, eight thousand animals were placed in a camp four miles from Burgersdorp, the area of which was three thousand acres. The veld, poor to begin with, had already been grazed over, and, moreover, had been "trodden out" by the troops In short, it was practically bare."

"As if this were not brutal enough, no extra forage was permitted to be given to the miserable animals, and, worse still, no provisions were made for an adequate water supply. The condition of the few dams, stamped into mud by thousands of hoofs, will be better left to the imagination of such a person as one of the heads of the Veterinary Staff, who at this time delivered himself of the sapient opinion that "Colonial horses were no bally good and ought to be shot." Being a military man and an expert in horseflesh, he was, of course, ignorant of the fact that these same horses were of identical stock with those which carried De Wet and his merry men so easily out of reach of the foreign-mounted British "flying" columns."

"The animals were in prime condition when they were brought in, and for about two months the adults lived on such scanty pasture as they could find—and their own fat. The foals mostly died of sheer starvation within the first ten days. At the end of seven or eight weeks the horses, mares, and mules began to die of starvation and thirst at the rate of from seventy to eighty a day. Their bleached bones and parched hides lie to this day on the bare veld of Cruelty Camp to witness to this ghastly fact. It should be added that at no time was there any horse-sickness in the camp."

"Eye-witnesses have told me in terms actually piteous in their graphic simplicity how they fell from utter weakness, struggled to their feet again after a rest, only to fall again; how they lifted their heads a few times, as stricken or starving horses will do, and then obeyed the military mandate and lay still what time the vultures gathered over them.

Thus perished within reach of plenty, which British regulations, blindly carried out by British officers, forbade them to reach, nearly ten thousand animals, all country bred. They were deliberately murdered, starved to death by the same hopelessly pig-headed incompetence which was even then scouring the world for horses that cost from £50 to £60 apiece when landed in South Africa."

"Many of the mares and foals were, of course, not fit for service, but they were for that very reason useless to the enemy, and the doing of them to death only adds to

the brutality of the useless act. The ordinary person at home who has had the pleasure of paying the difference between the useful Colonial horses that were deliberately starved to death and the useless foreign horse which only came out to lose us chances of victory and then die, may be pardoned for wondering why even a Chief of Veterinary Staff did not see that it would have been better service to the Empire to have used these animals, or even to allow their owners to employ them for transport, rather than condemn them to the most miserable of deaths."

CLAIM FOR SERVICES RENDERED.

Counterclaim for Value of Dog's Skin.

At Brompton County Court, London, on Tuesday, before Judge Stonor, Mr. Edward H. Scott, veterinary surgeon, 75 Kinnerton Street, Knightsbridge, W., brought an action against Mr. Benjamin Last, 35 Albert Gate, W., claiming £1 3s. 6d. for professional services rendered and the keep of defendant's dog when it was suffering from distemper. The defendant counterclaimed for £5, as the value of the dog's skin of which, it was said, he had been deprived by the plaintiff's action.

Mr. Gingell, solicitor, appeared for the plaintiff, and the defendant personally conducted his case.

The plaintiff stated that the dog was brought to him in February, 1901, suffering from distemper. He treated the animal for about a fortnight when it died. It was in respect of the services and keep of the dog during that fortnight that he now claimed.

The defendant stated that Mr. Scott undertook to cure the dog within ten days, and that it was upon such an understanding that the animal was left. Subsequently he was informed by Mr. Scott that the dog had died and been buried. He submitted, however, that plaintiff should not have had the dog buried without his (defendant's) knowledge.

Mr. Scott added that during the time the dog was under treatment it was visited by the defendant on several occasions and, indeed, just before it died. As the animal died of distemper it was necessary not to delay its burial. As regarded the skin, it was absolutely of no value, nor was the dog when alive.

Defendant: It was a magnificent skin. I should like to have had it dressed.

Plaintiff: The animal was only a mongrel.

William H. Weeden, called by the defendant, stated that he took the dog to Mr. Scott who said he could cure the animal in ten days. No one visited the dog after then.

The Judge came to the conclusion that plaintiff was entitled to something for his services, but that he should have consulted the defendant before having the dog buried. There would be a verdict for plaintiff for £1 on the claim, and for the defendant £1 on the counterclaim.

ALLEGED NEGLIGENCE.

At the Brompton County Court (London), on Monday, before Judge Stonor, J. A. Preece & Sons, Ltd., livery stable proprietor, 7 Pont Street, Belgravia, W., brought a claim against Messrs. Hobson & Co., 119 Pall Mall, in respect of the keep of a horse. There was no dispute as to the claim, but some important questions arose in connection with a counter claim in which the defendant sought to recover £50 for injuries to the horse, said to have been caused through negligence on the part of the plaintiff or his servants.

The main question before the Court is whether a horse such as the one in question—a "blood cob"—should be tied up in a stall by means of a leather halter or strap, or whether an iron chain was a proper thing to use for the purpose.

Mr. A. Hobson, of the defendant firm, stated an iron chain such as the plaintiff had used might be suitable for a heavy cart horse, but a light leather strap with a small chain at one end was the proper thing with which to fasten up a horse like the one in question. It appeared that the plaintiff had used a heavy chain, and the horse getting one of its legs over it, had sustained a badly lacerated knee. He paid 90 guineas for the animal, but after sustaining the injuries it fetched at public auction only £25. Witness had been to a large number of shops and found that the old fashioned chain halters were not now to be bought.

Mr. J. Parker, harness maker, Long Acre, W., stated that the proper thing to use for tying a horse in a stall was either a leather strap or a rope, and he would consider that the plaintiff was guilty of negligence in using a heavy chain. The latter might do for cart horses, but was not adapted for tying up a valuable blood cob.

Plaintiff's solicitor said that his client had several hundred horses and used iron chains throughout his stables.

Mr. Parker added that his firm had the largest business of the kind in England, and he was able to say that they had not been asked for the chain halters for the last ten years.

The Judge: This is a very important question, and I think there should be experts called on both sides, and that the case should be tried before a jury. I shall give judgment for plaintiff on his claim, and strike out the counter-claim; but, of course, the defendant can bring an action.

SWINE FEVER AT SANDFORD.

A Farmer Fined.

At Crediton, Charles Hawkins, of West Pidsley Farm, Sandford, was summoned for not promptly notifying to the police that a pig in his possession was affected with fever.—Sergeant Mogridge stated that on March 16th defendant came to the police station and said a pig of his was ill. Witness asked him what was the matter with it, and he replied that there had been so many pigs bad and killed round about, he did not know; that it might be inflammation or swine fever. He further stated that one of his pigs died on the previous Thursday, and he had buried it in the orchard. Witness told him it was his duty at once to have reported the matter to the local constable.

Mr. J. P. Heath, veterinary surgeon, of Exeter, said, acting upon instructions, he visited the place on March 18th. He gave orders for the pig to be dug up, and made a post-mortem examination. He found the pig had been suffering from swine fever. He then gave orders for the second animal to be slaughtered, and found this one more severely affected. Defendant rendered him all the assistance he possible could, but in his opinion if the case had not been reported when it was the disease would probably have extended all over the place, which would have been a very serious matter.

Supt. Egan said through the negligence of Mr. Hawkins the Board of Agriculture and the County Council had been put to considerable expense in sending their officers to scour the county.

Defendant said at first he thought it was a case of inflammation, as he had been informed that many animals in the parish were suffering from that disease, and he thought he was doing his best by having the animal buried, instead of sending away meat he should be sorry to consume himself.

The Chairman said it was a serious offence, and, although the defendant had done his best when it came to the last, it was then to a certain extent too late. Viewing all the circumstances, they saw no alternative but to inflict a penalty; but in consideration of his

having rendered to the officers the assistance he did, they would only fine him 1s. and costs, amounting together to £1 10s. 6d.—Defendant asked to have the costs remitted, but the Chairman did not think they were justified in putting the costs on the county.—*Western Morning News.*

JOHN FREEMAN MEMORIAL FUND.

Sir,

I shall feel obliged if you will publish in your next issue the following further list of Subscribers to "The John Freeman Memorial Fund." It would greatly facilitate the work of the Committee if intending subscribers would remit their subscriptions at once.—Yours faithfully, E. C. WINTER, F.R.C.V.S.

Queen Street, Limerick.
April 21st.

	£	s.	d.
Already acknowledged	59	5	0
T. S. Price	1	1	0
J. A. Jordan	1	1	0
D. C. Pallin, A.V.D.		10	6
W. Henderson	1	1	0
J. H. Bell, A.V.D.	1	1	0
R. S. Garroway	1	1	0
W. B. Edwards, A.V.D.	1	1	0
R. Moore, Lieut.-Col., A.V.D.	1	1	0
J. A. Gosling	1	1	0
J. J. Griffith, A.V.D.	1	1	0
Louis Magee		10	0
E. S. Gillet, A.V.D.	1	1	0
R. H. Holmes, A.V.D.	1	1	0
E. H. Leach	1	1	0
J. A. Russell, A.V.D.	1	1	0
H. H. S. George	1	1	0
Wm. Pallin, Jun., A.V.D.	1	1	0
Total	£76	0	6

COMMITTEE ON SHEEP-DIPS.

The Right Hon. R. W. Hanbury, M.P., President of the Board of Agriculture, has appointed a Departmental Committee to investigate experimentally and to inquire into and report upon—

1. The composition and essential constituents of efficient dips and other preparations for the treatment and dressing of sheep, and their effect upon the animal treated or dressed and upon the parasites and other organisms for the destruction of which they are used.
2. The methods in which such dips and other preparations should be employed, and the appliances and facilities requisite for the purpose.
3. The times and intervals at which sheep should be treated or dressed, regard being had (*a*) to the life-history and characteristics of the sheep-scab Acarus and of the other parasites and organisms of sheep which require external treatment, and (*b*) to the practical conditions under which sheep-farming is carried on in various parts of the United Kingdom.

The Committee consists of the following gentlemen—viz., Mr. Laurence Hardy, M.P. (chairman); Sir Henry Hall Scott, Dr. Thomas E. Thorpe, C.B., F.R.S., Director of the Government Laboratory; Mr. J. Bowen-Jones, Professor John Richard Campbell, B.Sc., one of the Assistant Secretaries to the Department of Agriculture and Technical Instruction for Ireland; Mr. A. C. Cope, M.R.C.V.S., Chief Veterinary Officer of the Board of Agriculture; Mr. Matthew Flanagan, J.P., of Tomona, Tulsk, County Roscommon; Mr. M. Hedley, F.R.C.V.S., Chief Inspector of the Department of Agriculture and Technical Instruction for Ireland; and Dr. William Somerville, one of the Assistant Secretaries of the Board of Agriculture. Professor Winter, M.A, will act as Secretary to the Committee.

Parasitic Mange in Ireland.

That troublesome equine disease, parasitic mange, like its somewhat closely allied ovine pest, sheep scab, continues prevalent over a wide area throughout the country. This is well exemplified by the returns of the Department of Agriculture, which show that during the first three months of the current year no fewer than 88 outbreaks of mange were reported from various parts of Ireland. This figure, when compared with the corresponding total for the opening quarter of last year, is very unsatisfactory, the cases twelve months ago numbering only 39. During the month of March 16 out of our 32 counties were scheduled as harbouring this disease. It is noteworthy that no fewer than eight of the nine Ulster counties were returned as affected areas, the only "free" district being the Co. Monaghan. The eight other diseased counties included four in in Munster, three in Leinster, and one in Cannaught. —*Farmers' Gazette.*

Spread of Anthrax.

Owing to the outbreak of anthrax in the district of Kidderminster the Board of Agriculture have sent Mr. Fulford, superintendent-inspector, to make inquiries into the subject. On Thursday, April 9th, he met the farmers of the district and went into the subject with them. Persian wool was blamed for the outbreaks. It was stated that the shoddy from it was used by farmers as manure, thus causing the mischief. Mr. Fulford said they would have to make out a strong case before they could interfere with a great industry by stopping the importation of raw material because the by products from it caused loss in certain directions. The remedy was in the hands of those who used the material complained of by ceasing to use it. He thought there was no cause for panic or alarm. The Board of Agriculture had every desire to assist the farmer.—*Daily News.*

Veterinary Surgeon Contracts Hydrophobia.

Paris, April 20.

Le Petit Journal prints a dispatch from Warsaw, dated Saturday, which reports that about a fortnight ago Dr. Zacharoff, Professor of Medicine and Director of the Veterinary College, was dissecting a dog which had died of rabies. While operating on the brain he slightly pricked his finger. He took no further notice; but on Thursday last symptoms of hydrophobia made their appearance. His condition is regarded as hopeless.—Dalziel.

Personal.

MARRIAGE.—At St. Mary's Episcopal Church, Newport, on the 18th inst., by the Rev. Canon Hodson, William Crawford, M.R.C.V.S., Leeds, to Anna Stewart, second daughter of the late Colonel Mitchell, Wellgate House, Newport, Fife.

THE LATE MR. CHARLES RADWAY, M.R.C.V.S.—Mrs. Radway and family desire to thank the many friends for kind enquiries and letters of sympathy, and also to express their appreciation of the tribute paid to the deceased in the many and beautiful wreaths received, they being too numerous to acknowledge separately.

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette*:

WAR OFFICE, PALL MALL, April 21.

Vet.-Major John Cooper, F.R.C.V.S., is placed on temporary half pay on account of ill-health. Dated 8th February, 1903.

The name of Vet.-Lieut. Alexander John Dalgleish is as now stated and not as described in *The Gazette* of 10th March, 1903.

The following notification is substituted for that which appeared in *The Gazette* of 20th March, 1903 :—

Vet. Lieut. Colonel Charles Clayton, on attaining the age of 55 years, is retained in the Service under the provisions of Article 473, Royal Warrant, as a Supernumerary to the Establishment. Dated 15th March, 1903.

Vet.-Major J. Brodie-Mills, J.P., Fellow Bombay University, Principal and Professor of Veterinary Science, Govt. Veterinary College, Bombay, has been granted 12 months furlough from 7th March, 1903, the first four months of the furlough being on full pay—a concession granted to him for the duties he has performed in connection with the plague.

CORRESPONDENCE.

BREECH PRESENTATIONS AND UMBILICAL HERNIA.

Sir,

I am rather surprised at the suggestions of both your anonymous correspondents in the above connection.

Surely in a breech presentation and *in a mare*, about the worst possible thing one could do would be to sever a hind leg at the metatarsal bone. By so doing most probably a foot and a rough or sharp piece of metatarsal bone would fall into the womb and two jagged ends of attached metatarsal bones would be prodding the womb and injuring the vagina during delivery. Most veterinary surgeons, I believe, hamstring the fœtus in this position, though personally I think, if it can be done, cutting down on the hip joint and wrenching a hind leg off at the hip joint is the best plan.

As regards umbilical hernia in young foals, I have known this to disappear spontaneously in a month or two when the abdominal muscles gain in size and strength.

If it does not disappear external applications are generally useless and futile and courting disaster. Tell the owner there is slight danger, and then operate. Ascertain whether your hernia is adherent or not. Return it into the abdomen and suture the sac, of course, paying attention to the details of present day surgery. Removal by clam is another very effective method, and "Enquirer" will find very full and plain directions as to this method in "Möller's Veterinary Surgery," by J. A. W. Dollar, pp. 239-242.—Yours truly,

SURPRISED.

P.S. Chloroform is an advantage in a prolonged operation in both connections.

Sir,

"Obstetricus" enquires about an instrument for "breech" presentations. I can recommend him Pollock's Guillotine, No. 600 in Arnold's list. I have one and should be very sorry to be without it ; it is very efficacious, light, but powerful.—Yours faithfully,

Rugby, April 21st. J. S. BARBER, M.R.C.V.S.

"VETERINARY OR TRADE."

Sir,

On a stand at Dublin Spring Show last week a London manufacturer of surgical instruments had the enclosed directions for the treatment of milk fever, with his injecting syphons for sale :—

"DIRECTIONS FOR USE.

The treatment consists of simply injecting iodide of potassium into the udder through the teats.

The udder and teats should first be carefully washed with water and soap (in which a little carbolic acid has been mixed) and then thoroughly dried.

The following mixture should then be injected, care being taken that the injecting syphon has been disinfected in carbolic acid and water.

One drachm of iodide of potassium mixed with one quart of boiling water to be cooled down to 98° F. before being used. Half a pint to be injected into each quarter.

The animal must then be placed in a comfortable position on her chest, and the udder may be rubbed gently.

The position of the cow should then be changed every two or three hours.

Only one injection is necessary."

It may be the right thing to "spread the light" in every shape and form for the benefit of agriculturists, even though it circumscribes our field of action, but is it not likely that it will result in a considerable loss to cow owners, owing to the empiric's want of knowledge of the various complications which frequently set in.

The quack doctor armed with the syphon and pot. iod. will, of course, perform a certain number of miracles and thus render himself so famous that he will surely be called to treat a greater number of other diseases than he has been up to the present, especially in a poor country like Ireland where the hard-set farmer will naturally try to get work done on the cheapest scale. The same state of things may not prevail in richer countries, in which perhaps practitioners may not consider this matter worthy of notice. I think it well, however, to ask whether manufacturers who procure testimonials and support from the profession should be told that it is hardly within their province to exhibit prescriptions with their instruments. Have we not opportunities enough of seeing our instruments at the National Veterinary meetings, etc.? I have not seen medical instruments exhibited at public shows.

The extraordinary degree to which veterinary chemists now push their trade at shows, fairs and markets, aided by their local agents with marquees in which to entertain the customers to "a good drop of guaranteed ten years old and a little soda, etc." will leave the students of our numerous veterinary colleges little to do except a few laborious parturition cases and an odd other hard job.—Yours truly,

PRACTITIONER.

THE REGISTER OF THE R.C.V.S.

Sir,

In reference to your comments in the current number of *The Record* on the publication of the Register of the Royal College of Veterinary Surgeons, will you allow us as official publishers, of the Register to state that the loss entailed in its publication would rather be increased than diminished by the transference of its publication from a trading firm to the College itself. A considerable portion of the copies sold are disposed of through the retail book trade, and it would be a matter of considerable inconvenience both to veterinary surgeons and to their local booksellers to order through others than a commercial firm.—We are, sir, yours faithfully,

BAILLERE, TINDALL, AND COX.
F. V. FISHER.

8 Henrietta Street, Covent Garden, London.
April 18th.

CANINE TYPHUS.

Sir,

I notice in your last weeks *Record* under "Notes" by Henry Gray, M.R.C.V.S, a reference to canine typhus.

By this name I suppose is meant the disease that was so prevalent in England and on the Continent two years ago. Now I believe the mortality in this disease was greater (at any rate it was here) than that arising from dis-

temper any well tried and largely tried successful remedy deserves more than passing reference.

It is our duty to cure above all, if it is possible. If Mr. Gray has the material at hand or it is likely to become accessible to him, I am sure he would be doing the profession a great service by publishing it.

Especially would it be useful to know the dose of the hypodermic injection of salt and hydro chloride of quinine (I do not find this salt of quinine in "Veterinary Medicine"). How often the injection is to be given and whether it is advisable to vary the places of injection would be useful.

Some statistics of the treatment, if available, would also be very acceptable.—Yours truly,

G. MAYALL.

BAD TASTE, OR IGNORANCE?

Sir,

The enclosed cutting is taken from *The Farmer and Stockbreeder* of March 23rd last. I don't know who 'Vet.' is, or if he is a member of our profession. If he is a qualified veterinary surgeon, his advice is, I think, to say the least of it, in very bad taste, if he is not it is perhaps excusable from ignorance.—I am, etc.,

W. E. ISON, F.R.C.VS.

Atherstone, April 14.

COB REFUSING FOOD.—Will "Vet." kindly advise me what to do with an aged cob? When eating he drops his food, finding it hard to swallow. When out he has a running at the mouth.—LEANER.

The symptoms point to defective teeth. Examine them, and if rugged get the blacksmith to rasp them. —VET.

A NOTE ON CALVING.

Sir,

Thinking the following may be of use to any of the readers of *The Record* who may not have tried it, is the reason of my writing to you, viz., the comparative ease in many cases with which the calf may be put into proper position for calving in cases of wrong presentations by keeping the cow laid on her side, and raising up her hind quarters by placing a sack well filled with bedding underneath. At the same time I believe the danger of rupture is slightly increased.

If you think this may be of any interest or use to your readers please publish.—Yours faithfully,

"COUNTRY VET."

THE PROFESSION AND THE "QUACKS."

Sir,

For some time there has been a marked absence of widely prevailing contagious disease (excepting of course such hardy perennials as Swine Fever, etc.); the studs of working horses are low in numbers; electric traction has given a check to the demand for horses required for certain purposes: trade generally is dull and money scarce.

At a time like this it behoves the profession to take stock of itself and set its house in order; not that it will become defunct of necessity, but rather to avoid such a contingency. The latter portion of the heading indicates in the opinion of the writer the direction in which reform is required, and required urgently.

A few months ago the Chairman of a Veterinary Medical Society in his presidential capacity is reported to have said that he "did not fear any further intrusion of empirics." We have quite enough already and until we provide ourselves with means for repressing them their numbers will be continually augmented, as they have undoubtedly been during the last few years. I know of practices now undergoing competition from quacks that had been immune for a very long period. There is no question in our internal politics which can rival this in importance. The fact that there are considerable numbers of *young* men who are quacks (in the sense of being unqualified assistants or principals) may well demand the anxious consideration of those authorities who have charge of the destinies of the R.C.V.S. and the teaching schools. as every one of these young quacks represents a heavy loss in fees to these institutions, apart from the annual loss of thousands of pounds caused collectively to practising graduates of the Royal College, with whom they are competing. The modern quack resembles his ancient prototype in the possession of consummate adroitness and cheek, and there the analogy ends. He has a smattering of recent professional literature, does many minor and major operations with facility, indulges in such refinements as testing with mallein, in short, although not possessing all the nice details of practice, knows enough to save his face as a rule, and thus hoodwinks the general public, which is seldom able to discriminate between ability and bounce. Competition from such a quack is not to be despised. His limitations are that he is unable to describe himself as a veterinary surgeon or to legally recover fees for advice, etc.; the latter being easily remedied by charging more for medicine. Again, how often does the qualified man avail himself of the privilege of sueing to recover fees for advice?

On the other hand think of his advantages—he may purchase suitable premises with the money that another misguided individual would expend in obtaining a diploma; he displays an elaborate signboard ornamented with the legend "Horses and dogs carefully attended to," or "Shoeing forge and infirmary for Horses and dogs," or perhaps both. He can circularise the district, advertise constantly in the local papers, tout amongst the clients of the neighbouring qualified practitioner, offer to do the work at a lower price, and if he should be of an unscrupulous disposition a whole vista of possibilities can be utilised by him, and all owing to the fact that as long as he does not use the word "Veterinary" he remains without the pale of the Registration Committee.

It would seem, therefore, that unless a veterinary surgeon is the holder of lucrative appointments involving the presence of his name on the register, he is better with it off. It is a deplorable state of affairs. Veterinary surgeons themselves cannot all be held exempt from blame, in that many a quack now practising on his own account has originally been taught what he knows while in the employ of a qualified man.

Another most injudicious procedure is for a college to allow persons to attend the final year's practical course—including clinique—without having undergone the previous curriculum and examinations.

These, however, are details which, if attended to, would discourage the manufacture of the quack. Legislation has from time to time had for its object the preservation of the rights of veterinary surgeons, together with the protection of the public; its success has only been partial, not through faulty execution so much as insufficiency of its scope.

The time has now arrived when it should be made legally impossible for a quack to commence or continue in the practice of veterinary medicine or surgery; the training and expense involved in the production of the modern graduate give him a right to demand this. The cure is simple, and consists of the inclusion in our next charter of a clause making it illegal for any unqualified person to practice veterinary medicine or surgery (excepting pupils under a certain age), with adequate penalties for infringement. I am told that this is the case in some States in America.

It may be urged that the medical faculty has no law so sweeping as the above would be; possibly not, in so many words, but the necessity of a medical certificate in case of death, or in default a coroner's inquest renders it impossible for quacks to exist.—Yours obediently,

REBUS.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED.—Messrs. S. Stockman, E. R. Edwards, R. Finch, H. Gray, W. Robb, M. Clarkson, G. Mayall, W. Anderson, C. Crowhurst.

"*The Castration of Cryptorchid Horses*," by F. Hobday; "*A Plea for Sense and Science*," *The South Staffordshire Chronicle*; *Halifax Evening Courier*.

April 11.

Messrs. C. Cunningham, W. R. Davis, J. Campbell Hill, J. McGavin, W. C. Ison, H. T. Ryan.

American Veterinary Review. *Jrnl. Comp. Med. and Vety. Arch.* (Phila: Feb.) *Report of the Minister of Agriculture for the Dominion of Canada, 1902*: *Oxford Times*, *The Racing Pigeon*, *Western Morning News*.

April 18.

Messrs. G. Mayall, J. S. Barber, W. Collinson, Ballière, Tindall and Cox, P. Braid, E. Wallis Hoare. "The Doctor Sahib," "Surprised," "Practitioner."

Report of an Investigation into the relationship of Human and Bovine Tuberculosis, by David J. Hamilton and J. McLauchlan Young. *The Ludlow Advertiser*, *The Scotsman*. *Llanelly & County Guardian*, *The North British Agriculturist*.

April 25.

Veterinary Societies—Addresses.

Alterations for this list must be duly notified by the Secretaries

BORDER COUNTIES V.M.S.
Pres: Mr. J. W. Hewson, M.R.C.V.S., Wigton
Hon. Sec. (*pro tem.*): Mr. F. W. Garnett, M.R.C.V.S., Dalegarth, Windermere
Meetings, Second Friday of Feb., June, and October

CENTRAL V.M.S.
Pres. Mr. W. Perryman, M.R.C.V.S., 139 Fentiman-road, S.W.
Hon. Sec: Mr E. Lionel Stroud, F.R.C.V.S., 29 Spring-st., Hyde Park, W.
Meetings, First Thursday in each month, except August and September, 10 Red Lion Square, Holborn, at 7 p.m.

CENTRAL V.A. OF IRELAND.
Pres. Mr. M. J. Cleary, M.R.C.V.S., Kilpatrick, Mullingar
Hon. Sec: Mr J. J. Vahey, M.R.C.V.S., Ballinrobe
Treas: Mr. J. F. Healey, M.R.C.V.S., Midleton

EASTERN COUNTIES V.M.A.
Pres: Mr. Fred. Morton Wallis, M.R.C.V.S., Halstead, Essex
Hon. Sec.: Mr. H. P. Standley, M.R.C.V.S. Wymondham
Meetings, Second Tuesday, Feb. and July

GLASGOW V.M.S.
Pres. Principal McCall.
Hon. Sec. Mr. Walter Gardner

VET. MED. ASSN. OF IRELAND.
Pres: Mr. Chas. Allen, F.R.C.V.S., 35 North Frederick st., Dublin
Hon. Sec. Mr. J. McKenny, M.R.C.V.S. 116 Stephens-green-west, Dublin

LANCASHIRE V.M.A.
Pres: Mr. R. Hughes, F.R.C.V.S., Oswestry
Hon. Sec.: Mr. G. H. Locke, M.R.C.V.S. Grosvenor-street, Manchester
Meetings, 1st Thursday in April, June, Sept., & Dec.

LINCOLNSHIRE V.M.S.
Pres. Mr. H. Caulton Reeks, F.R.C.V.S., Spalding
Hon. Sec: Mr. T. Turner, M.R.C.V.S., Sleaford
Treas: Mr. E. C. Russell, M.R.C.V.S., Grantham
Meetings, Second Thursday, Feb., June and October

MIDLAND COUNTIES V.M.A.
Pres: Mr. Thomas Chambers, M.R.C.V.S., Wolverhampton-st, Dudley
Hon. Sec: Mr. H. J. Dawes, F.R.C.V.S., Camden House, High St., West Bromwich
Meetings, Second Tuesday, Wednesday, Thursday, and Friday alternately in Feb., May, Aug. and Nov.

NATIONAL VET. ASSOCIATION.
Pres: Mr. Frank W. Garnett, M.R.C.V.S., Windermere
Sec: Mr. William Hunting, F.R.C.V.S.
Treas: Mr. F. W. Wragg, F.R.C.V.S., Whitechapel, London.

NATIONAL VETERINARY BENEVOLENT & MUTUAL DEFENCE SOCIETY.
Pres: Mr. W. A. Taylor, F.R.C.V.S., Tower-st, Manchester
Treas: Mr. E. Faulkner, F.R.C.V.S., Manchester
Hon. Sec: Mr. Sam. Locke, M.R.C.V.S. Grosvenor Street, Oxford-st., Manchester

NEW SOUTH WALES V.M.A.
Pres; Mr. John Stewart, H. AND A.S.
Vice: Mr. John Pottie, H. and A.S.
Hon. Sec. & Treas: Mr. J. D. Stewart, M.R.C.V.S.

NORTH OF ENGLAND V.M.A.
Pres: Mr. G. Craik, M.R.C.V.S., Alnwick
Hon. Sec: Mr. E. R. Gibson, M.R.C.V.S. 25 Marlborough-street, Seaham Harbour
Meetings, Third Friday, Feb., May, Aug. and Nov.

NORTH OF SCOTLAND V.M.S.
Pres: Mr. J. McLauchlan Young, F.R.C.V.S., Univ. Aberdeen
Sec. & Treas: Mr. Clement Baxter, M.R.C.V.S., Elgin

NORTH WALES V.M.A.
Pres: Mr. H. O. Richard, M.R.C.V.S., Corwen
Hon. Sec. O. Trevor Williams, M.R.C.V.S., Llangefni
Meetings, First Tuesday, March and September

ONTARIO V.A.
Pres: Mr. J. H. Tennent, V.S., London, Ontario
Sec: & *Treas*: Mr. C. H. Sweetapple, V.S., Toronto, Ontario

ROYAL COUNTIES V.M.A.
Pres: Mr. James East, M.R.C.V.S., Aylesbury
Hon. Sec: Mr. Percy J. Simpson, M.R.C.V.S., Kendrick House, Maidenhead
Meetings, Last Friday, Feb., June and Nov.

ROYAL SCOTTISH V.S.
Pres: Mr. Reid, M.R.C.V.S., Auchtermuchty.
Hon. Sec: Mr. W. D. Fairbairn, M.R.C.V.S., Cupar, Fifeshire

ROYAL VETERINARY COLLEGE M.A.
Pres: Prof. Woodruff
Hon. Sec: Mr. W. H. Chase, M.R.C.V.S.
Assist. H.S. Mr. Guy Sutton

SCOTTISH METROPOLITAN V.M.S.
Pres: Mr. John Connochie, M.R.C.V.S., Aytoun
Hon. Sec: Mr. John Aitken, Junr., M.R.C.V.S., Dalkeith

SOUTH DURHAM AND NORTH YORKSHIRE V.M.A.
Pres.: Mr. E. H. Pratt, M.R.C.V.S., Northallerton
Hon. Sec: Mr. W. Awde, F.R.C.V.S., Stockton-on-Tees.
Meetings, First Friday, Mar., June, Sept. and Dec.

SOUTHERN COUNTIES V.M.S.
Pres: Mr. E. R. Harding, M.R.C.V.S, Fisherton st, Salisbury
Hon. Sec: Mr. F. Spencer, M.R.C.V.S., Basingstoke, Hants
Meetings, Last Thursday, Mar., June and Sept.

TRANSVAAL V.M.A.
Pres: Capt. Irvine Smith, South African Constabulary
Hon. Sec: Mr. Kirby Pilkington, M.R.C.V.S., Johannesburg

SOUTH WALES AND MONMOUTHSHIRE V.M.A.
Pres: Mr. E. Sayer, M.R.C.V.S., Newport, Mon.
Hon Sec. Mr. D. G. Davies, M.R.C.V.S., High-st, Swansea
Treas. Mr. E. Sayer, M.R.C.V.S., Newport, Mon.
Meetings First Thursday in March, and Autumn.

WESTERN COUNTIES V.M.A.
Pres: Mr. W. Roach, F.R.C.V.S., York-rd, Exeter
Hon. Sec: Mr. W. Ascott, M.R.C.V.S., Bideford
Treas: Mr. P. G. Bond, M.R.C.V.S., Plymouth
Meetings, Third Thursday, March, July and November

WEST OF SCOTLAND V.M.A.
Pres: Dr. James McIntosh McCall, Vety. Coll. Glasgow
Hon. Sec: & *Treas*: Mr. J. Bishop, M.R.C.V.S., 754 Garscube Road, Glasgow

YORKSHIRE V.M.A
Pres: Mr. A. C. Thompson, M.R.C.V.S., Doncaster
Treas: Mr. J. E. Scriven, M.R.C.V.S., Tadcaster
Hon. Sec; Mr. H G. Bowes, M.R.C.V.S., 6 De Grey-ter. Leeds
Meetings, Last Friday in Jan., April, and October, and a Thursday in July.